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3. Proposed by CHARLES E. MYERS, Canton, Ohio.

A spherical air-bubble, having risen from a depth of 1,500 feet in water, was one inch in diameter when it reached the surface; what was its diameter at the point of starting?

4. Proposed by DeVOLSON WOOD, M.A., C. E., Professor of Mechanical Engineering, Stevens Institute of Technology, Hoboken, New Jersey.

A particle starts at rest and revolves in a circle with a uniform acceleration, acquiring a velocity v in t seconds. Find the locus of the foot of the perpendicular from the centre of the circle upon the resultant acceleration.

5. Proposed by J. R. BALDWIN. A. M., Professor of Mathematics and Commercial Law, Davenport Business College, Davenport, Iowa.

A 200 pound ball lies on a three legged table, having the legs equally distant apart and perpendicular to the plane of the top of the table. (1) What is the weight on each leg of the table not including the top when the ball is 2 feet, 3 feet, and 4 feet distant from the three legs? (2) If the ball is 2 feet, 3 feet, and 5 feet from the legs, what must be the weight of the top to keep from tipping and the weight on each leg excluding the top and also including the top?

DIOPHANTINE ANALYSIS.

Conducted by J. M. COLAW, Monterey, Va. All contributions to this department should be sent to him.

PROBLEMS.

1. Proposed by EARL D. WEST, West Middleburg, Logan County, Ohio.

It is required to divide a given square number into two such parts that each part will be a square number.

2. Proposed by J. M. COLAW, Principal of High School, Monterey, Virginia.

Find two numbers, such that the difference of their squares may be a cube, and the difference of their cubes a square.

3. Proposed by O. S. KIBLER, Superintendent of Schools, West Middleburg, Logan County, Ohio.

It is required to find three whole numbers in an arithmetical progression, such that the sum of every two of them shall be a square.

4. Proposed by H. W. HOLYCROSS, Superintendent of Schools, Pottersburg, Union County, Ohio.

What value of x will render $4x^4+12x^3-3x^2-2x+1$ a square?

AVERAGE AND PROBABILITY.

Conducted by B. F. FINKEL, Kidder, Missouri. All contributions to this department should be sent to him.

PROBLEMS.